Just need some satisfaction: examining the relationship between passion for exercise and the basic psychological needs

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ARTICLE

Just need some satisfaction: examining the relationship between passion for exercise and the basic psychological needs.

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Abstract

Background: Individuals often pursue activities for which they are passionate, and this passion is operationalized as being harmonious (an autonomous desire to engage in the activity) or obsessive (a controlled desire to engage in the activity) in nature. With regard to harmonious passion, Vallerand and colleagues suggests that it is fostered in environments that nurture innate needs for autonomy, competence, and relatedness. *Purpose:* The purpose of the present study was to explore the nature of the passion (harmonious, obsessive)-basic psychological needs (competence, autonomy, relatedness) relationship. *Methods:* Kinesiology students (n = 917; M_{age} 18.54, SD = 1.66) completed the Passion Scale and Psychological Need Satisfaction in Exercise Scale. *Results:* Results from the SEM path analysis indicated that *harmonious* passion was positively related to competence (SPE = 0.43) and relatedness (SPE = 0.43) and *obsessive* passion was negatively related to autonomy (SPE = -0.18) (CFI = 0.90, RMSEA = 0.07, SRMR = 0.07). *Conclusions:* These finding have significant implications for exercise participation/enjoyment are discussed.
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Introduction

The beneficial psychological and physiological health outcomes associated with physical activity engagement are well documented (Warburton et al., 2006). Positive outcomes include improvement in mental and physical health (Penedo and Dahn, 2005), reduction in the impact of chronic disease (Garcia-Aymerich et al., 2006), and social integration and personal growth (Wankel and Berger, 1990). The influential sources suggested to drive individuals to persist in physical activity have also been investigated. Specifically, there are a number of explanations that inform the adoption of a physically active lifestyle, and these include but are not limited to, competence-related motives, body-related motives, interest or enjoyment motives, as well as extrinsic/reward motives (Markland and Ingledew, 2007). Another source of influence used to predict or explain individual behaviours related to physical activity is an individual's passion for that particular activity.

Given that passion can manifest itself in a variety of ways, an individual's level of passion can often be the central internal force contributing to the pursuit of desired behaviours (Vallerand, 2008). Vallerand and colleagues initiated research pertaining to passion by first advancing constitutive and operational definitions (Vallerand, 2008; Vallerand et al., 2003). Specifically, they defined passion as "a strong inclination toward an activity that people like, that they find important, and in which they invest time and energy" (Vallerand et al., 2003). Furthermore, they emphasize that passion is present when an activity represents something of significance and value, and highlight that this feeling can

enrich the life experience (Vallerand, 2008). Interestingly, the passionate experience that contributes to the pursuit of an activity can be influenced in two ways. In order to explain this phenomenon, Vallerand and colleagues introduced the Dualistic Model of Passion (DMP) as the operational definition, which is comprised of harmonious and obsessive passion (Vallerand, 2008; Vallerand et al., 2003).

Harmonious passion "results from an autonomous internalization of the activity into the person's identity" (Vallerand et al., 2003), whereas obsessive passion "results from a controlled internalization of the activity into one's identity" (Vallerand et al., 2003). Those experiencing harmonious passion are in control of their own activity participation and can freely decide when and when not to engage in the activity. Conversely, obsessively passionate individuals experience an internal compulsion to engage in the activity, even when not appropriate to do so (e.g., neglecting work, or family)—it goes beyond the person's self-control.

Previous research has demonstrated harmonious passion to be associated with various positive outcomes such as life satisfaction, vitality, and positive affect, while obsessive passion is predominantly related to negative outcomes such as life conflict, ill-health, and avoidant tendencies (Vallerand, 2012). Recently, Carpentier and colleagues (2012) found that individuals who are harmoniously passionate tend to experience a greater sense of flow (described by the authors as a sense of complete mastery over their environment) during their activities and subsequently report increased well-being. In contrast, individuals expressing obsessive passion have a greater difficulty in achieving 'flow,' and thus tend to ruminate about their passionate activities while involved in other activities. Clearly, the contrasting types of passion may contribute—positively or negatively—to the experiences of a particular behaviour.

Vallerand and his colleagues have utilised Self-Determination Theory (SDT; Deci and Ryan, 2000) as a framework for the construct of passion. Theoretically and empirically speaking, while passion and motivation are both in essence motivational constructs—and are indeed related—they are certainly distinct factors (Vallerand et al., 2003). Conceptually speaking, Vallerand (2012) argues that passion differs from motivation in that the latter does not address the potential for both adaptive and maladaptive outcomes. A main distinction then, is that passion reflects the innate liking for the activity and the internalization of the activity as part of one's identity (Vallerand et al., 2011). In contrast, SDT suggests that individuals participate in behaviours that satisfy innate basic needs, provide more autonomous motivation (i.e., self-determined), and facilitate the internalization of norms and values which correspond with their integrated structures (Deci and Ryan, 1985; 2002). Given that a plethora of studies have examined the relationship between the motivational regulations of the basic psychological needs (i.e., autonomy, competence, and relatedness) in certain physical activity settings (see Ntoumanis, 2012), the examination of passion (as opposed to motivation) for physical activity and the relationship with the basic psychological needs should also be examined and contrasted with that of the motivation literature.

Deci and Ryan (2002) suggested that the extent to which the three psychological needs (competence, autonomy, and relatedness) are fulfilled is fundamental to the growth and well-being of individuals. In addition, this fulfilment may increase the likelihood that individuals participate in physical activity. Autonomy refers to the need to experience a sense of volition by being able to freely select activities in which to engage (deCharms, 1968; Deci and Ryan, 2002), competence is the need to feel effective in dealing with or mastering one's environment (Deci and Ryan, 2002; White, 1959), and finally, relatedness occurs through the development of secure and connected relationships with others (Baumeister and Leary, 1995; Deci and Ryan, 2002).

Previous literature exploring the influence of the basic psychological needs suggests that positive fulfillment of competence and relatedness mediates the relationship between participation in leisure activities and life satisfaction among adolescents (Leversen et al., 2012). Additionally, university students who reported high levels of physical activity (i.e., more health-enhancing physical activity or HEPA), have significantly greater satisfaction of competence, autonomy, and relatedness than minimally active participants (McEwan and Sweet, 2012). Furthermore, high school students who were provided the option to participate in physical education classes (e.g., high satisfaction of basic needs) versus those who were forced to engage, were found to show greater persistence, effort, and better performance (Vansteenkiste et al., 2004). Despite the availability of research identifying the positive implications of basic psychological need fulfillment in physical activity environments (e.g., exercise, sport, physical education), there appears to be a lack of investigations with passion. This is interesting considering the proposition that harmonious passion is best fostered in an environment that nurtures innate needs for autonomy, competence, and relatedness (Vallerand et al., 2003).

As Vallerand and colleagues (2003) suggest, people engage in activities that are internalized into one's core or self-identity in an attempt to satisfy these basic psychological needs. For example, autonomy supportive environments increase the development of harmonious passion, while the development of obsessive passion is linked to activities, which are over-valued or over-defined in one's identity (Mageau et al., 2009). In physical activity settings such as sport, the relationship between basic psychological needs and passion has been identified. First, both the satisfaction of the psychological needs and the experience of harmonious passion have negatively predicted athlete burnout (e.g., Curran et al., 2011; Hodge et al., 2008; Lonsdale et al., 2009). In addition, the relationship between harmonious passion and burnout was mediated by self-determined regulation as well as psychological need satisfaction (Curran et al., 2011, 2013). Therefore, these results highlight the importance of harmoniously passionate activity participation with regards to satisfying basic psychological needs and the avoidance of negative consequences (e.g., dropout).

Similarly in sport, passion has been found to influence various social processes that may offer a potential link to the need for relatedness. For example, harmonious passion was found to be associated with better quality coach-

athlete relationships (Lafrenière, Jowett, Vallerand, Donahue, and Lorimer, 2008), as well as better quality interpersonal relationships, and greater feelings of interpersonal closeness, and connectedness (Phillipe, Vallerand, Houlfort, Lavigne, and Donohue, 2010). Conversely, obsessive passion is associated with decreased quality of interpersonal relationships, and lower feelings of interpersonal closeness and connectedness (Phillipe et al., 2010).

In a closely related context (physical education), autonomous motivation was found to mediate an indirect relationship between autonomy support and physical activity involvement (Halvari, Ulstad, Bagøien, and Skjesol, 2009). As it pertains to passion, these findings highlight the importance of experiencing volition and choice in a particular activity (i.e., satisfaction of the basic need for autonomy), which is representative of harmoniously passionate individuals. Indeed, harmonious passion is an important construct to examine in the physical activity setting as it is concerned with the involvement of autonomous engagement.

The previous results demonstrated from other physical activity contexts may translate to the exercise setting, which is defined as planned and structured physical activity to maintain or improve physical fitness (Bouchard, Blair, and Haskell, 2007). Specifically, a harmoniously passionate exerciser should experience greater satisfaction of his/her basic psychological needs. Similarly, obsessively passionate exercisers may experience less need satisfaction due to the manifestation of negative exercise related outcomes (e.g., exercise dependence). In fact, symptoms of exercise dependence have been reported among obsessively passionate exercisers (Paradis, Cooke, Martin, and Hall, 2013). This follows the suggestions of Vallerand et al. (2007), whereby harmonious passion is experienced when the activity is freely accepted as important and interesting or enjoyable. Alternatively, obsessive passion may lead to an internal compulsion to engage in the activity, and subsequently contribute to poor health (Vallerand, 2012).

Therefore, given the demonstrated relationship between passion and the basic psychological needs in other contexts (i.e., sport, physical education) and its potential influence in the exercise setting, the purpose of the present study was to specifically examine the nature of the passion-basic needs relationship in an exercise context. The general hypothesis for the present study was that passion for exercise would be related to the three basic needs (autonomy, competence, and relatedness). More specifically, it was hypothesized that harmonious passion would be positively related to autonomy (due to volitional nature of participation), competence (due to satisfaction of increased ability and level of exercise), and relatedness (due to social bonds formed in the exercise environment), whereas obsessive passion would be negatively related to autonomy (due to a loss of control for exercise intention and participation), competence (due to dissatisfaction with current ability and level of exercise) and relatedness (due to pre-occupation with exercise and inability to appreciate the social environment).

Methods

Participants

Participants included 917 kinesiology students (n = 510 females, n = 407 males; M_{age} 18.54, SD = 1.66) from a major university in Canada. Participants were asked to answer an open-ended question about their preferred activity types, and while a variety of exercise activities were reported, running, weight lifting, and group fitness classes were the most common (see below). It is important to highlight that this population was purposefully sampled due to their high affinity for exercise and physical activity engagement (as pursuing academics in this field) as well as the potential for a more heterogeneous representation of exercise types.

Measures

Demographics. The Godin-Shephard Leisure Time Exercise Questionnaire (LTEQ; Godin, Jobin, and Bouillon, 1986; Godin and Shepherd, 1985) was used to assess the frequency, intensity, and duration of the various forms of exercise reported by participants. In addition to the LTEQ, participants were asked to indicate their three most frequent exercise types. The responses included: running (n = 656), weight lifting (n = 650), group fitness classes (n = 177), cycling (n = 130), and yoga (n = 91). More than 70% of participants reported they often engaged in an activity long enough to work up a sweat. In line with recent recommendations from Godin (2011), the physical activity score was calculated using only moderate and vigorous types of activity. Given that a score greater than 24 suggests substantial health benefits, our population was highly active with an average weekly score of 60.9 (30.1) (Godin, 2011).

Passion. Passion for exercise was assessed using the Passion Scale (Vallerand et al., 2003). The Passion Scale is a 14-item inventory that assesses two dimensions of passion: harmonious (seven items; e.g., "For me, this activity is a passion that I still manage to control") and obsessive (seven items; e.g., "I have difficulty imagining my life without this activity"). Responses are provided on a seven point Likert-type scale anchored at the extremes of 1 (*do not agree at all*) and 7 (*completely agree*), with higher scores reflecting stronger levels of passion. Scores from this measure have been shown to be psychometrically sound, demonstrating good reliability (see Table 1) and good validity from a number of studies (e.g., Phillipe et al., 2010; Vallerand et al., 2003). Finally, internal consistency scores were adequate for both harmonious (α = 0.82) and obsessive passion (α = 0.93) respectively (Cronbach, 1951).

Basic Psychological Needs Satisfaction. The Basic Psychological Needs were assessed using the Psychological Need Satisfaction in Exercise Scale (PNSE; Wilson et al., 2006). The PNSE is an 18-item questionnaire assessing three dimensions (six items each): autonomy, competence, and relatedness. Responses are provided on a six point Likert-type scale anchored at the extremes of 1 (*False)* and 6 (*True*), with higher scores reflecting greater satisfaction of the basic needs. Sample items from this measure include: "I feel free to exercise in my own way" (autonomy), "I feel capable of completing exercises that are challenging to me" (competence), and "I feel connected to the people who I interact with while we exercise together" (relatedness). Previous

research highlights the PNSE possesses adequate reliability and factorial validity (Wilson et al., 2003; 2006). In the current study, internal consistency scores were adequate for all three subscales: autonomy (α = 0.92), competence (α = 0.87), and relatedness (α = 0.88) respectively (Cronbach, 1951).

Table 1: Descriptive statistics.

Variable	Mean	SD	A	Skewness	Kurtosis
Harmonious Passion	5.58	0.90	0.82	-0.89	1.66
Obsessive Passion	3.76	1.56	0.93	0.13	-0.89
Autonomy	5.07	0.98	0.92	-1.30	1.47
Competence	4.79	0.87	0.87	-0.63	0.10
Relatedness	4.65	0.97	0.88	-0.64	0.13

Note. (*n* = 917)
Scores for the passion dimensions range from 1-7
Scores for the psychological needs in exercise scale from 1-6

Procedure

After obtaining ethical approval from the lead author's institution research ethics board, instructors in kinesiology were contacted to obtain permission to recruit participants from their classes. Once approval was granted, the research team addressed available classes to request their participation and distribute the letters of information. Consenting participants were provided with the LTEQ (Godin et al., 1986; Godin and Shepherd, 1985), the Passion Scale (Vallerand et al., 2003), and the PNSE (Wilson et al., 2006). To counter for potential order effects, questionnaires were counterbalanced at random when administered to participants. Upon completion, questionnaires were returned and participants were thanked for their time. All data were entered into SPSS 20.0 statistical software program and, in accordance with recommendations from Tabachnick and Fidell (2013), data were screened and cleaned prior to conducting the analysis. Any missing data (less than 10% missing at random) were treated with the series mean substitution method (Tabachnick and Fidell, 2013).

Results

Descriptive Statistics

Descriptive statistics, Cronbach's alpha values, along with skewness and kurtosis data are reported in Table 1, while bivariate correlations are reported in Table 2.

Table 2: Bivariate correlations.

Measure	1.	2.	3.	4.	5.
1. Harmonious	-	0.45**	0.02	0.40**	0.39**
2. Obsessive		-	-0.014**	0.19**	0.21**
3. Autonomy			-	0.20**	0.07*
4. Competence				-	0.37**
5. Relatedness					-

Note. (n = 917)
**Significant at p < .01; *Significant at p < .05

Passion-Basic Psychological Needs Relationship The relationship between passion and satisfaction of basic psychological needs in exercise was assessed using Structural Equation Modelling (SEM) via Amos 20.0 (Arbuckle, 2011). Specifically, one overall model was tested which assessed paths from harmonious and obsessive passion (co-varied) to the three basic psychological needs of competence, autonomy, and relatedness. These relationships were analyzed based on the significance of the standardized parameter estimates (SPE; i.e., paths). Assessing model fit was done through the Comparative Fit Index (CFI; Bentler, 1990), the Root Mean Square Error of Approximation (RMSEA; Browne and Cudeck, 1993), and the Standardized Root Mean Square Residual (SRMR; Bentler, 1995). According to Tabachnick and Fidell (2013), the most commonly reported fit indices are the CFI and RMSEA. Likewise, Hu and Bentler (1999) suggested reporting the CFI and the SRMR; therefore, the three aforementioned fit indices were selected to assess the model. In terms of model fit, values > 0.90 for the CFI and < 0.08 for the RMSEA and SRMR are said to be adequate (Bentler, 1995; Browne and Cudeck, 1993), while values > 0.95 for the CFI and < 0.06 for the RMSEA and SRMR are said to be excellent (Hu and Bentler, 1999).

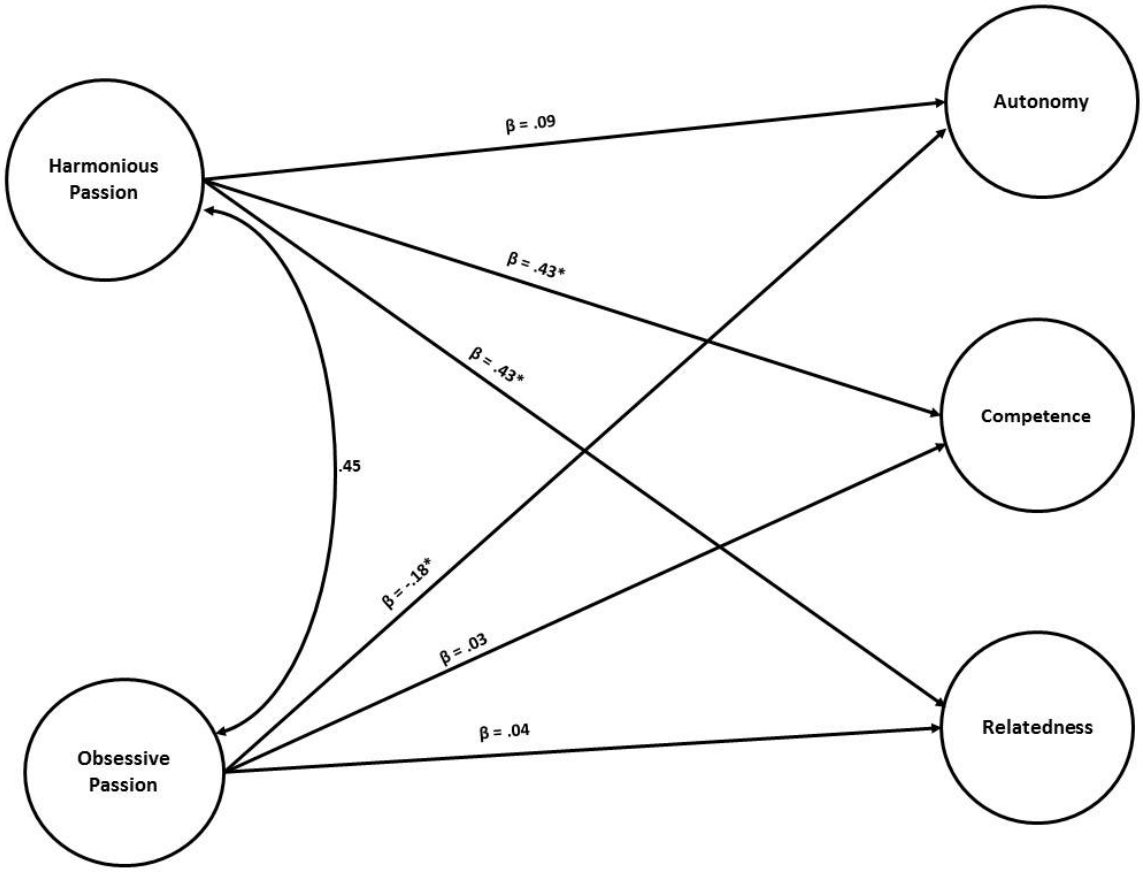
Structural Equation Modeling

A structural model using the maximum likelihood estimation assessed the relationship between harmonious/ obsessive passion and the satisfaction with the basic psychological needs in exercise (see Figure 1). The maximum likelihood estimation was selected as it has been found to be appropriate with sample sizes greater than 500 (Hu, Bentler, and Kano, 1992). A latent factor model was tested using the items of the scale as indicators (i.e., no parcelling was used). The model yielded adequate model fit (χ^2 = 242.22, df = 454, p = 0.00, CFI = 0.90, RMSEA = 0.07, SRMR = 0.07). Harmonious and obsessive passion significantly co-varied at 0.45. In addition the residuals of competence and

autonomy as well as competence and relatedness significantly co-varied at .19 and 0.21, respectively. However, the residuals between autonomy and relatedness did not yield a significant covariance (0.07).

Obsessive passion. Obsessive passion was found to be negatively related to one basic psychological needs variable: autonomy (SPE= -0.18). The paths from obsessive passion to competence (SPE = 0.03) and to relatedness (SPE = 0.04) were not significant.

Figure 1: Path model for passion and basic psychological needs.



Note. *Significant at p = 0.00; CFI = 0.90, RMSEA = 0.07, SRMR = 0.07

Harmonious passion. Harmonious passion was positively related with two basic psychological needs variables. The significant paths included harmonious passion to competence (SPE = 0.43) and to relatedness (SPE = 0.43). The path from harmonious passion to autonomy was not significant (SPE = 0.09).

Discussion

The purpose of the present study was to determine the nature of the passion-basic needs relationship in regular exercisers, and any differences in that relationship for harmonious and obsessive passion. It was hypothesized

that harmonious passion would be positively related to all three basic needs, while obsessive passion would be negatively related to these needs.

Examination of the results partially supported the advanced hypotheses. Specifically, harmonious passion was related positively to competence and relatedness however no relationship was evident with autonomy. In regards to obsessive passion, it had a significant negative relationship with autonomy, however no significant associations were found for competence or relatedness. In the following section, we will discuss the findings and will advance potential implications for exercise environments.

Exercisers who reported high levels of harmonious passion also reported high levels of competence for their particular exercise activity. Similar findings have been supported in the literature as competence was significantly related to enjoyment and positive affect (Puente and Anshel, 2010)—constructs that share similar components to harmonious passion. Moreover, environments reflecting autonomy support contributed to the prediction of competence reported by individuals (Adie et al., 2008; Ratelle et al., 2005). Examination among adult exercisers highlighted that competence was a significant predictor of adherence and dropout (Vlachopoulos and Neikou, 2007). Specifically, higher scores of the need for competence decreased the probability of the exerciser belonging to the dropout group (Vlachopoulos and Neikou, 2007). Furthermore, Carpentier et al. (2012) found that harmonious passion was linked to greater flow (i.e., a sense of mastery) during activities—a construct seemingly similar to competence. Evidently, exercisers with high levels of harmonious passion, who persisted in the activity due to inherent enjoyment, reported high satisfaction for competence.

In addition to high levels of competence, exercisers who reported harmonious passion for exercise also experienced satisfaction of the need for relatedness. Interestingly, Deci and Ryan (2000) proposed that extrinsic motivation requires the satisfaction of autonomy and competence, however not necessarily relatedness as some activities can be done alone (e.g., exercise). However, in dealing with an activity for which one is passionate about, it seems relatedness is more salient. Relatedness reflects the innate fundamental desire to connect with others (Baumeister and Leary, 1995) and thus, if exercise and/or physical activity engagement is a passion for someone, they will likely seek the affiliation of those who share that passion. As indicated by Eccles and colleagues (2003), involvement in leisure activities can connect individuals to similar others, provide shared experiences, and reinforce existing friendships. Not surprisingly then, in the context of sport, athletes that were passionate about their sport also perceived greater perceptions of team cohesion (i.e., a form of relatedness) (Paradis et al., 2012). The current findings also suggest that young adult exercisers with a high level of harmonious passion feel their need for relatedness is satisfied in their exercise experiences. In fact, previous research found that individuals' who were motivated to participate in leisure activities for social reasons reported high levels of intrinsic motivation (i.e., engaging in the activity for the pleasure, satisfaction, and interest derived solely from the behaviour itself (Ingledew and

Markland, 2008)). Furthermore, Phillipe et al. (2010) found harmonious passion to be associated with feelings of interpersonal closeness and connectedness in various activity groups. This is in line with the present study's findings, whereby harmoniously passionate exercisers reported the need for relatedness fulfilled and thus experienced satisfaction with the social components of their exercise engagement.

Interestingly, the present findings did not reveal a significant relationship between harmonious passion and autonomy. This is surprising considering that harmonious passion is an "autonomous internalization of the activity into the person's identity" (Vallerand et al., 2003). Likewise, students in autonomy supportive groups have greater intentions to participate and reported more frequent leisure time physical activity behaviour (Chatzisarantis and Hagger, 2009). Consequently, exercisers who experience harmonious passion should report higher levels of autonomy. The research conducted by Halvari et al., (2009) could provide one potential explanation for this finding. Specifically, these authors found that autonomy support was not directly linked to harmonious passion, but was mediated by perceived competence (Halvari et al., 2009). As the authors suggested, it is beneficial for students emulating harmonious passion to perceive themselves as competent in order to be effective in their respective activity (Halvari et al., 2009). Accordingly, further exploration of potential mediating variables that may influence the passion-basic needs relationship is warranted.

Given that obsessive passion is characterized by engaging in activities that are over-valued or over-defined into one's identity (Mageau et al., 2009), the observed negative relationship with autonomy in the current study is fitting. Specifically, obsessive passion is linked to a controlled internalization of an activity into one's identity (Deci and Ryan, 2000; Vallerand et al., 2003), meaning an individual is controlled by their need to participate in the activity. The current study indicates that obsessively passionate individuals will experience a reduction in personal volition (i.e., autonomy). Likewise, exercisers may become more apt to pursue a particular behaviour due to an increase in their obsession, and therefore experience a reduction in their need for autonomy. Recent work by Paradis et al. (2013) supports this idea as exercisers with high obsessive passion demonstrated all seven exercise dependence symptoms which includes *lack of control* (unsuccessful efforts to cut back on exercise; Symons-Downs et al., 2004). Specifically, this dimension indicates a lack of ability to reduce the frequency, intensity, and duration of exercise behaviour, potentially suggesting a reduced level of choice for engagement. As such, results from the present study suggest that when an exerciser experiences increased obsessive passion, the association with their perceived autonomy (i.e., choice or volition) is less salient.

Consequently, autonomy may play a significant role in the delineation between the two types of passion, particularly given autonomy supportive environments play a key role in health-related settings such as sport (Pelletier et al., 2001), oral health and smoking cessation (Halvari and Halvari, 2006; Williams et al., 2002), and physical education (Goudas et al., 1995). As noted by Halvari et al. (2009), it is important to create autonomy

supportive contexts to facilitate the intrinsic development of all three basic needs as this may increase motivation for exercise behaviour. In addition, given the negative consequences of obsessive passion (e.g., ill-being, increased injury, rigid persistence; Rip et al., 2006; Stephan et al., 2009; Vallerand et al., 2003), it appears critical to foster the need for autonomy.

Results from Puente and Anshel (2010) indicate that perceived autonomy was significantly inversely related to negative affect among a population of undergraduate physical education students. Moreover, Adie et al. (2008) found that athletes who reported low perceptions of autonomy reported higher levels of emotional and physical exhaustion in their respective sport. Similarly, the present study found that exercisers, who reported high levels of obsessive passion, also reported low levels of autonomy. As a result of the observed relationship, exercisers may be more likely to persist in activities, which cause harm (e.g., injury, illness), reduce their engagement in other activities, or be more likely to experience dropout. Findings from Paradis et al. (2013) support this suggestion as obsessively passionate exercisers reported a significant positive relationship with the exercise dependence symptoms of *reduction in other activities* (social, occupational, or recreational activities that are given up or reduced because of exercise) and *continuance* (exercise that is continued despite the knowledge of having a persistent or recurrent physical or psychological problem; Symons-Downs et al., 2004). Additionally, albeit not in an exercise context, researchers found that students reporting a high level of obsessive passion for music did not share a relationship with persistence in their passionate domain (Bonneville-Roussy et al., 2013). Evidently, it is important to be cognisant of the type of passion an exerciser may exude, as this could be linked to decreased satisfaction of a particular basic psychological need and further contribute to negative consequences for participation.

The current study is not without its limitations. Specifically, a purposeful sample of kinesiology students was selected to provide insight into the variables for highly active individuals. Accordingly, the findings should be interpreted with caution as generalizability to more heterogeneous, less active samples may be inappropriate. The results may lend application with highly specialized populations, such as competitive athletes or youth engaging in a specific sport or activity. Additionally, given the cross-sectional design of the present study, causality cannot be inferred.

Future research should aim to replicate these findings among more diverse populations. Given the findings pertaining to the link between obsessive passion and autonomy, examination of these constructs may be important among specific exercise types—such as elite runners or body builders. For example, previous research has found that long distance runners who were obsessively passionate were more susceptible to injury (Stephan et al., 2009). As such, assessment of the basic needs among specialized populations may help identify which constructs require further attention.

Authors' Qualifications

The authors' qualifications are as follows: Kyle F Paradis, PhD, Lisa M. Cooke, MHK, Luc J Martin PhD, and Craig R Hall, PhD.

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